Leech Biology for Bushwalkers

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AARGH! A LEECH!

I woke up wheezing for breath, hardly able to see through my swollen eyelids and unable to feel one side of my face. OK, it was a hard days work; wet, cold, lots of mud, but this was a bit much. I just couldn't figure it out... until I felt the blood running down my neck. A leech bite! I had just discovered that I am allergic to leeches! OK, so now what? find my antihistamine tablets, use my inhaler and after a couple of hours start to feel vaguely human again. Next step was a visit to my library in order to satisfy my curiosity about leeches. Here's what I learnt...

What is a Leech?

Leeches are annelid worms from the class Hirudinea. They usually have a sucker at either end of their body. The body is supported by a hydrostatic skeleton which stiffens the body like a hose full of water (and makes it very difficult to squash!). They are generally dark coloured with lighter stripes on their back, hence the common name for some species of 'Tiger Leeches'.

There are over 45 species of aquatic and terrestrial leeches recorded in Australia. Adults generally range between 2 and 10 cm in length. The largest leeches come from inland drainage systems and include the genus *Richardsonianus*, a specimen of which, measuring over 20 cm fully extended, was collected at Lightning Ridge.

Not all leeches are parasites, many aquatic species eat insect larvae, snails, other worms and decaying vegetation. Terrestrial leeches rely on the blood they extract from passing birds, frogs, reptiles and mammals, including humans. Leeches move by attaching their head sucker to a surface, arching their back bringing their hind sucker forward, holding on with it and then releasing their head sucker and reaching forward to repeat the action.

Leech Bites

Walkers and passing animals collect leeches by brushing against foliage where they rest. Leeches can sense light and heat with small receptors near their head and have scent organs in their skin. Aquatic leeches can sense vibrations through the water and will move to their source to feed.

Once on an animal, leeches retreat from light, for example into socks, boot tops and collars. They feed for up to two hours consuming between two and ten times their own weight (usually about 5 ml of blood) before they release their grip. One meal may last the leech for months. The blood is digested in the leech's stomach by a bacterium, which prevents the growth of other organisms that may cause the blood to putrefy.

Bites from leeches are usually painless as the result of an anaesthetic secreted in the saliva (which may account for my numb face). Under the head sucker they have jaws with many sharp teeth. Aquatic leeches usually have three jaws and terrestrial leeches have two. Australian terrestrial leeches generally leave two short cuts in a 'V' shape in the host's skin. After the flesh is broken, a proboscis may be inserted for feeding or the leech may simply suck from the skin surface.

Most leeches secrete an anticoagulant polysaccharide known as Hirudin in their saliva. Similar anticoagulants are used in commercially available bruise treatments.

Removing Leeches

Leeches should not be pulled off as this may tear the skin or leave mouthparts in the wound allowing it to become ulcerated or infected. Leeches can be removed by applying heat such as a smouldering twig, sprinkling with salt or, more simply, by allowing them to drop off when engorged.

To save being attacked by the same leech again, such as in a camp site, they can be drowned in a container of soapy water. Squashing does not work well (remember that hydrostatic skeleton!). If you will be exposed to more leeches, change your socks or clothes and wash the blood off your skin. This lessens the likelihood of other leeches 'smelling' your old bites and being attracted to you.

Leech bites generally bleed slowly for a long time (10 minutes up to 5 hours). A band-aid on a leech bite will usually aid blood clotting. After about 12 hours most people suffer itchiness, which can be relieved by a number of over the counter preparations, such as calamine lotion, tea tree oil and creams containing lignocaine.

Leech Allergy

Some people develop an allergy to leech saliva. It usually arises through repeated exposure to leech bites and these people usually carry treatments prescribed by their doctor such as an inhaler spray, antihistamine or other tablets, and possibly injections. People with very severe reactions or who are exposed to leeches in their occupation, can be treated using immunotherapy with leech extracts.

Allergic reactions may range from red, swollen welts to anaphylactic shock. Any signs of a reaction should be treated seriously. If the person has a swollen throat, then sucking ice may alleviate symptoms until they can obtain medical treatment. Artificial respiration should be administered if the patient stops breathing.

Avoiding Leech Bites

Apart from staying at home, there are a number of methods to minimise leech bites. These include using insecticide around socks and shoes, wearing fine weave socks with no seam holes at the ankles, sealing trouser legs to boots with tight socks, gaiters or elastic bandages, or continually removing the leeches before they have an opportunity to bite.

Medicinal Uses

The medicinal leech *Hirudio medicinalis,* which has its natural distribution throughout Europe, has been used since the early 1800's for bloodletting in cases such as black eyes, pleurisy, pericarditis, meningitis, appendicitis and liver congestion.

An active market for Australian native leeches was developed by 1835. They were collected by people wading bare-legged into swamps or by pegging the skin of a freshly killed sheep to a river bed. In 1869 a cargo of the Australian leech *Hirudio quinquestriata* was exported to London.

Today leeches are occasionally used in micro-surgery and skin grafting operations to lessen bruising and swelling through their anticoagulant and blood removing properties.

Reproduction

All leeches are hermaphrodite, having both male and female reproductive organs. When mating, leeches intertwine their bodies and deposit sperm in their partner's genital area. Some time later the leeches secrete a cocoon and deposit their eggs, fertilised with their partner's sperm. The cocoon is then attached to a safe spot such as under a rock. The cocoon later splits releasing immature leeches.

Conservation Status

The medicinal leech is now extinct in many parts of Europe. This is believed to have arisen from collection for blood letting and recent renewed collecting pressure for medical research. Habitat loss, for example through draining of swamps causing a decrease in the number of host frogs, has also contributed to the threatened status of the medicinal leech.

Steps towards the protection of the medicinal leech have included bans on the collection and exportation of leeches from some countries, studies on the biology and conservation potential of some British populations, captive breeding programmes and chemical synthesis of substances previously obtained from leeches.

In Australia it appears likely that some of our leeches may eventually be threatened by loss of habitat. The most immediate threats to aquatic species arise through regulation and increasing salinity in inland rivers. Terrestrial species may be threatened by clearing of wet forests in south-eastern Australia.

As far as I can ascertain there has been no research as to the conservation status of leeches in Australia. I am sure most bushwalkers and campers entertain the thought of leech extinction regularly, but this may not necessarily be a good thing. Who knows, someone may find another use for leeches besides medicine and annoyance.

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